Remittances and Risk Diversification in Developing Country Context: Evidence from Sri Lanka

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Remittances and Risk Diversification in Developing Country Context: Evidence from Sri Lanka

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ABSTRACT

This study examines the risk diversification of remittance receivers in developing countries, with specific focus on Sri Lanka. Study uses survey data on migration and remittances collected from 750 remittance receiving and non-receiving households in Sri Lanka. Descriptive statistics and Propensity Score matching analysis are used to analyze data. Inter and intra group comparisons of income profiles and other descriptive statistics provide evidence for risk diversification of remittance receivers. Remittance receiving households receive income from diversified sources that support them to diversify the risk they face in the local context. In the propensity score matching analysis it was found that remittances uplift the remittance receivers in the income hierarchy.

Keywords: Labour Migration, Remittances, Risk Diversification, South Asia

JEL codes: O1, J6, C1; E2; E7

1. Introduction

International migration has become a center for discussion in number of social science disciplines including, economics, demography and geography. In the past decade migration flow has been rapidly increased reaching to 247 million. These migrants send a large flow of remittances to their home countries. According to the World Bank, over 73 percent of the international remittance flow goes to developing countries. It is about three times as the amount of official aids received by them. Hence, the role that the remittances play in developing country context has been getting the attraction of policy makers, researchers and development agencies.

As a result, focus of migration literature has been turning towards remittances and the role they play at both micro and macro levels. Even though early theory of migration mainly focused on causes and development impact of migration at the macro level, recently developed theories such as, NELM examines remittances in a comprehensive manner. According to the risk diversification hypothesis of NELM, remittances help the receiving households to diversify the risk they face specially in the developing country context where the credit market is rather imperfect. However, risk diversification hypothesis lacks sufficient empirical evidence in labour sending, developing country case. This study intends to fill this gap empirically examining the risk diversification hypothesis of NELM theory based on a case study carried out in Sri Lanka, one of the main labour sending, developing countries in South Asia. Study examines the role remittances play in enhancing and diversifying the household income of the remittance receivers that allows them to diversify their risk.

2. Review of Literature

Early theory of migration was based on the theories and models presented by developmentalists and neo-classical economists in 1950s. Pluralists enriched the migration literature in 1980s. Most of these theories and models mainly discuss the causes and the role of migration in the development process in LDCs in terms of structural changes generated. As shown in Lewis theory (1954) and Todaro model (1969) migration which is caused by wage differentials helps to generate a balanced growth. These theories and models are based on the assumption of individual decision making. According to the neoclassical theory, migration decision is taken by individuals considering the potential financial benefits they can enjoy at their migrating destination.

Recent theories of migration is dominated by the theory of NELM, which was pioneered and enriched by Stark (1984, 1985); Stark and Bloom (1985); Stark and Levhari (1982); Lucas and Stark (1985) and Taylor and Martin (2001). It focuses on both causes and implications of labour migration at the micro, meso and macro levels.

Contrasting to the early theory, recent theories of migration is based on collective decision making assumption. As shown in the NELM, decision to migrate is taken by the households as a group. There is a mutually beneficial explicit or implicit contractual arrangement between migrant and the household (Lucas and Stark, 1985; Stark, 1991). Accordingly, household collectively finance the migrant for migration expecting a return. In turn, migrants remit money for the benefit of the household (Agrawal and Horowitz, 2002; Lucas and Stark, 1985; Funkshouser; 1995). NELM show three main motives for remitting money; i.e. pure altruism, pure self-interest and tempered altruism (Lucas and Stark, 1985). First, the pure altruism, explains that the migrants remit money to enhance the income and consumption of the household left behind. Second, pure self-interest refers to remitting money expecting migrant's own future development. According to self-interest motive, migrants remit money either to protect their inheritance or for the investments in the home country for the development of the future position of him while the migrant is working abroad in the household. Tempered altruism explains that remittances work as an insurance that helps the migrants to face the risk especially in a crisis.

- **Risk Diversification Hypothesis**

Risk diversification hypothesis is a significant feature in the NELM theory which has developed based on portfolio investment theory. It is linked to the tempered altruism motive of the labour migrants. Risk diversification hypothesis discusses the credit market imperfection in developing countries and the role that the remittances play in diversifying the risk. In most of developing countries institutional mechanism is not properly operated. Lack of properly operating institutional mechanism generates imperfection in the credit market. Specially, this is resulted in lack of properly functioning insurance market in developing countries. A properly functioning insurance market supports the individuals and household level businesses to manage the risk they face in the local context (Stark, 1991; Stark and Levhari, 1982). Absence of the properly functioning insurance market motivates people to find alternative strategies for risk management.

People tend to diversify the income to diversify the risk they face. Earning from a different economic context helps them to diversify the income and thereby to protect the income security at the household level (Massey et al. 1993; Stark, 1991; Stark and Levhari, 1982) and smooth the consumption of the household (Stark, 1991). Stark (1991) consider the pooling of household income generated from different sources by different household members as sharing risk or a type of co-insurance that helps the household during a crisis or economic shock such as, crop failure or unemployment. This theoretical presentation of Stark (1991) has supported by empirical evidence collected through a survey done in India in 1991. Accordingly, some rural people in India tend to marry their daughters to people in distant areas with different economic setting. This is done to diversify the risk that they face. According to Stark (1991),

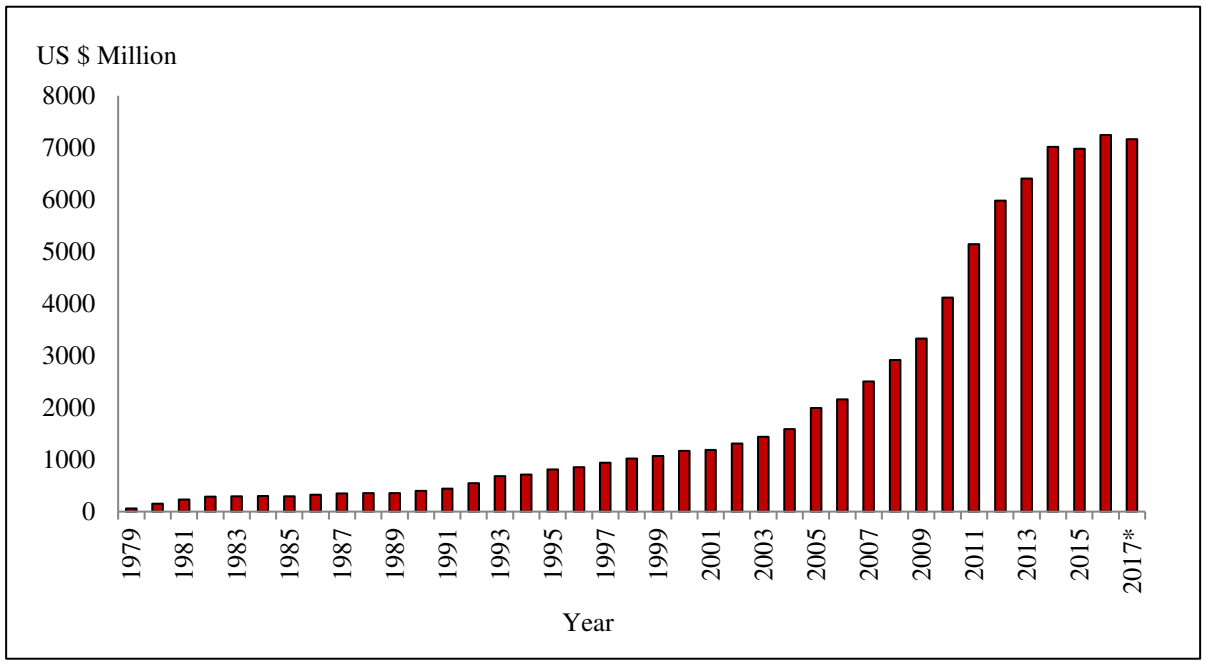
households in Philippines tend to select a trusty person to migrate. They prefer less uncertain income instead of high volume of remittances.

3. International Migration and Remittances in Sri Lanka

Sri Lanka as a developing country in the South Asian region is characterized by a large rural agriculture sector and a relatively small urban industrial sector. Currently Sri Lanka is considered as one of the popular labour sending countries in South Asia. Labour migration on a mass scale started in 1975 with the migration of Sri Lankan workers to Gulf countries (Gunatillake, 1991). According to the Sri Lanka Bureau of Foreign Employment (SLBFE), 262,677 Sri Lankans have migrated for work in 2015. Currently, migration flow consists of; over 33 percent housemaids, 7 percent of professional and middle level workers, 35 percent skilled labourers and 24 percent unskilled labourers.

From the opening up of the economy, foreign employment has grown and become the second largest earner of foreign exchange in Sri Lanka. Currently, Sri Lanka is in the 19th position among the top remittance receiving countries. Remittances have gradually increased during the last four decades (figure 1). In last two decades this has accelerated in a significant manner and become the most stable flow of foreign resource.

Figure 1 Remittances to Sri Lanka 1979-2017 (US$ million)



Source: Central Bank Reports, various issues

*Note: (*provisional)*

Currently Sri Lanka receives over US$ 7,100 million workers' remittances. It is significantly higher than foreign aid and foreign direct investments. At present, the value of remittances is over 67 percent of the export income which is the largest foreign resource flow to the country. According to the Central Bank, though these statistics represent the official figures of international remittances transferred through official channels, undocumented remittance figures make these statistics an under-estimate.

Labour migration has being becoming a central discussion point in the Sri Lankan context. Socio-economic impacts of labour migration, specially related to female labour migration and problems encountered in work places created interest in discussing the net benefits of labour migration to Sri Lanka. Evidence shows that labour migration has been solving the unemployment problem, which lasted for a long time and resulted in two youth insurgencies in Sri Lanka. As shown by Dias and Jayasundera (2004) and Korale (1983), labour migration has contributed to ease the unemployment problem significantly.

At the national level, remittances offset trade deficits, solving balance of payment problems and enhancing savings and investments in Sri Lanka (Arunatilake, Jayawardena, & Weerakoon, 2011). Evidence shows that remittances have contributed to enhance the economic growth of Sri Lanka (Cooray, 2012). As a developing country this massive flow of foreign resource is very important to Sri Lanka in achieving its development goals. Hence the government of Sri Lanka would much to promote foreign employment (GoSL, 2008).

Socio-economic implications of labour migration and the role played by remittances in the Sri Lankan context have created a dilemma for the Government of Sri Lanka (GOSL). While the discussions on adverse effects of labour migration are getting strong, the growing importance of remittances is becoming significant. Recent discussions on migration have been questioning the net benefits of migration. Despite the macro level importance of remittances, the role of remittances at the household level is not very clear. While the remittances are received and utilized by households, the poor empirical literature in the Sri Lankan context does not provide sufficient information about remittance utilization and household level impacts of remittances.

4. Methods

In the study survey data are used to examine two hypotheses; i.e. remittances raise the income of the migrant households and remittances help the households to diversify their income to diversify the risk. Survey on migration and remittances was carried out by the author with the support of trained staff and using a structured questionnaire. In the survey, data were collected from 750 remittance receiving and non-receiving households in Sri Lanka. Sample of the household was drawn randomly. Survey data were analyzed using descriptive statistical techniques and Propensity Score Matching analysis.

A binary logit model was used to estimate the determinants of migration and remittances. Estimated model was used to generate the propensity scores for the matching process. Assume that R_{ij} is a dummy variable indicating whether the i^{th} household is having labour migrants and receiving remittances, where one indicates the remittance receiving status. Then the probability of having a labour migrant and receiving remittances is:

$$\pi = pr(R_i = 1 \setminus X_i = x_i) = \frac{\exp(\beta_o + \beta_1 x_i)}{1 + \exp(\beta_0 + \beta_1 x_i)} \quad \text{(Eq. 1)}$$

Where, π_i is the probability of receiving remittances, x_i is a vector of covariates that determines migration and remittances. Binary logit model is used to predicted probabilities or propensity scores. Logit model used for estimation is:

$$\text{logit}(\pi_i) = \log\left(\frac{\pi_i}{1-\pi_i}\right) = \beta_0 + \beta_1 x_{i1} + \ldots + \beta_k x_{ik} \quad \text{(Eq. 2)}$$

Following Rosenbaum and Rubin (1984), covariates related to both treatment and outcome variables to the initial model are used to estimate propensity scores. In slecting covariates for determinants of migration and remittances, economic motives of the migrants, found in the above section as well as the results of previous empirical studies in the literature such as; Agrawal and Horwitz (2002); Gobel (2013); Randazzo and Piracha (2014); Clement (2011) and Bouoiyour (2015), were taken into consideration. From a large pool of demographic and socio-economic characteristics, most relevant covariates were selected using the backward elimination method. Selected covariates are; gender of the head, age of the head, education of the head, size of the houehold, children below 5 years and between 5 to 15 years, number of working age membersm number of employed people, having regular income source, having irregular income source, assets and the sector of the hosuehold. Remittance receiving status is taken as a binary variable indicating whether the household is receiving remittances or not. It is considered as the dependet variable.

Descriptions of the variables and descriptive statistics of selected variables are shown in Tables 1 and 2, respectively. Table 3 presents the estimation results of the logit model.

Table 1 Description of the Variables

Variable	Variable Name	Description
Rij (Dependent Variable)	Remittance Receipt	Binary variable indicating whether the household is receiving remittances (1= yes; 0= otherwise)
Covariates:	***Characteristic of the Head of the Household***	
GEN	Gender	Dummy variable indicating whether the head of the household is a female (1= female; 0=otherwise)
AGE	Age	Square of the years of age of the head of the household
EDU	Education	Binary variable indicating that the head has only primary level education
Covariates:	***Characteristics of the Household***	
HHS	Household Size	Size of the household
CHILD1	Dependents 1	Number of children below 5 years old
CHILD2	Dependents 2	Number of children between 5 to 15 years old
ADULT	Working Age Members	Number of household members of working age (15-64)
EMPL	Employed Members	Number of household members employed
REG	Regular Income Sources	Binary variable indicating whether the household has a regular income (1= has one or more; 0= otherwise)
IREG	Irregular Income Sources	Binary variable indicating whether the household has an irregular income (1= has one or more; 0=otherwise)
ASST1	Asset Ownership	Asset ownership measured by the Asset index
ASST2	Value of Assets	Total value of the assets owned by the households (Rs. Million)
SEC	Sector	Binary variable indicating whether the household is in rural sector (1= yes; 0= otherwise)

Table 2 Descriptive Statistics of Selected Variables

Variable ID	Remittance Receiving Households				Non-Remittance Receiving Households				Pooled Sample			
	Mean	Std. Dev.	Min.	Max.	Mean	Std. Dev.	Min.	Max.	Mean	Std. Dev.	Min.	Max.
AGE	44.00	14.64	19.00	87.00	51.22	14.56	19.00	88.00	45.79	14.94	19.00	88.00
HHS	3.33	1.26	1.00	7.00	3.63	1.26	1.00	7.00	3.40	1.26	2.00	7.00
CHILD 1	0.27	0.53	0.00	3.00	0.17	0.45	0.00	2.00	0.25	0.51	0.00	3.00
CHILD 2	0.60	0.80	0.00	3.00	0.43	0.67	0.00	3.00	0.56	0.78	00.00	3.00
ADULT	3.25	1.05	2.00	6.00	3.15	1.11	1.00	7.00	3.23	1.06	1.00	7.00
EMP	1.86	0.87	1.00	5.00	1.63	1.00	0.00	5.00	1.78	0.91	0.00	5.00
ASST	4.11	1.41	0.00	16.00	4.14	1.70	0.00	15.00	4.12	1.48	0.00	16.00
N=751												

Source: Calculated by author based on survey data

Table 3 Estimated Results of the Logit Model

Variable Name	Coefficient	Std. Error	Exp (B)
Characteristic of Head			
GEN	1.105**	0.223	3.02
AGE	-0.019**	0.007	0.982
EDU	0.555	0.356	1.743
Characteristics of Household			
HHS	-.908**	0.146	0.403
CHILD 1	1.044**	0.260	2.841
CHILD 2	1.001**	0.196	2.721
ADULT	0.885**	0.168	2.424
EMPL	0.530**	0.142	1.699
REG	-1.320**	0.262	0.267
IREG	-1.122**	0.221	0.326
ASST	0.114	0.071	1.120
SEC	0.392	0.211	1.480
Constant	0.481	0.654	1.618
Dependent variable: Remittance Receiving Status			
(Binary variable indicating the remittance Receipt; 1= if household receives; 0=otherwise)			
Exp(B)	3.016		
Percentage Correct	82.6		
N	751		

Source: Calculations of the author based on the survey data using SPSS 21 with R plug-in (Syntax Method)

*Note: statistical significance - ** <0.05, * <0.10.*

In the estimation results, odds ratio (EXP (B)) confirms that the logit model has adequately fit. Most of the covariates in the model are statistically significant. Since the logit model is adequately suitable it is used to generate propensity scores for generating a matched sample with three replacement ratios. This matched sample is used for further analyses in the chapter.

Improvement in the per capita household income by remittances is specifically calculated by estimating the average treatment effect. It was evident in the previous section that there is a significant disparity in volume of remittance and income among households. Stratified matching method is most suited when the cause variable is with high disparity level (Rosenbaum and Rubin (1984). Hence, in analyzing the remittance effect on household income, stratified matching method is employed and Average Treatment Effect is estimated using SPSS 21 with the support of R plug-in and using the syntax method. In stratified matching analysis, comparison is done by matching households with the reference group. Reference group is the households who have similar socio-economic and demographic characteristics. Using the propensity scores generated by the logit model in the first section of this chapter, households were categorized into five strata. Following Rosenbaum and Rubin (1984), outliers were removed.

Before and after the matching, situations were compared and the balance diagnostics were carried out. Balancing results and the plots before and after matching confirmed that after matching, almost all the covariates between remittance receiving and non-receiving samples are not significantly different in each block/stratum. Non-significance of the mean differences between the two samples confirms that after matching, samples are suitable for the comparison. Further, histograms of these two groups of households overlapped after matching. QQ plots and propensity score distributions also confirm this. These confirm the equivalence of distribution of the two groups after matching. This implies that after matching, equivalence of distribution has achieved.

Using the stratified matching approach, Average Treatment Effects were estimated. In the stratified matching analysis, ATT is estimated as:

$$ATT = \left(\sum_{q=1}^{Q-} \frac{\sum_{i=1} Y_j^R}{N_q^R} - \frac{\sum_j Y_j^{NR}}{N_q^{NR}}\right) * \frac{N_q^R}{N^R} \qquad \text{(Eq. 3)}$$

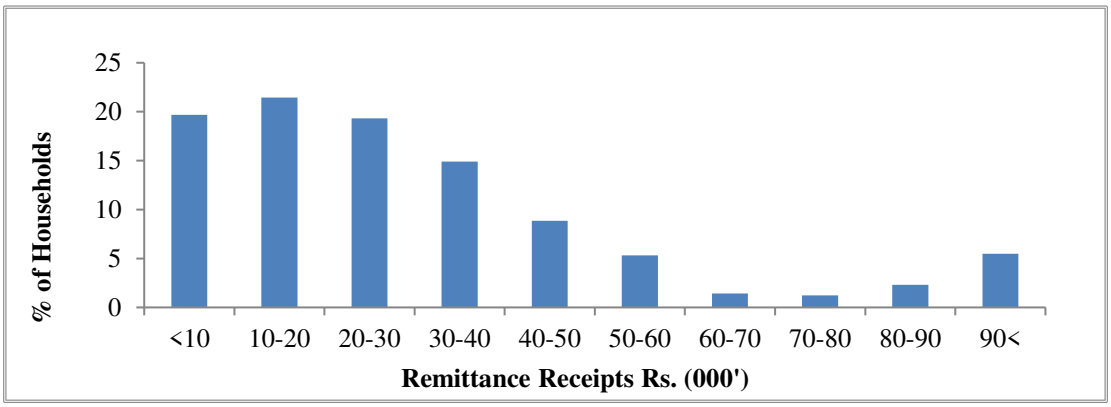
Where, *Y* is the outcome, *R* is the remittance receiving households, *NR* is the non-remittance receiving Households, *N* sample sizes, *Q* is the number of stratum and ATT is the average treatment effect of treated. Weighted sum of ATT is the weighted average of ATT. It represents total treatment effect on the outcome. When the impact of remittances on household income is examined, then the weighted sum of ATT shows the total income of the remittance receiving households compared to their non-remittance receiving counterparts.

5. Results

In the survey, it was found that more than 89 percent of the migrant households receive remittances at least once in three months. This is higher in the rural sector compared to urban sector. The volume of remittances received by the households varies. It is interesting to note a significant disparity in the

volume of remittance receipts. While more than 19 percent of the households receive Rs.10,000 or less, about six percent of the households received Rs. 90,000 or more than that per month Figure 2).

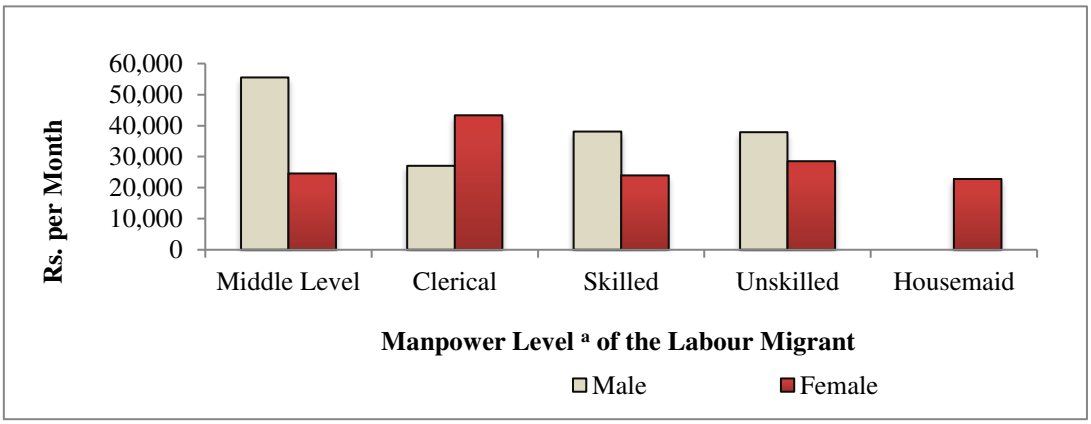
Figure 2 Distribution of Households by Volume of the Remittance Receipts



Source: Developed by the author based on the survey

The reason for the disparity is either the differences in the demographic and socio-economic background of the households or the skill levels of the migrants. It was found that, females receive larger amount of remittances compared to males. On the other hand male migrants send a larger amount of remittances to their households left behind. Households in the urban sector receive more remittances while the rural and the estate sectors respectively are behind. Showing the relationship between family ties and remitting behavior, married migrants send a comparatively higher level of remittances to their left behinds compared to singles. On the other hand, migrants in different skill levels remit different amounts of remittances based on their earning capacity at the destination country (figure 3)

Figure 3 Remittances by the Manpower Level and Gender of the Migrant



Source: Developed by the author based on the survey data

Note: SLBFE Manpower classification

As shown in the figure, skilled migrants are more capable of remitting larger amounts. The amount remitted by a middle level labour migrant is significantly higher than that of migrants at other skill

levels. However, it is noteworthy that the amount remitted by female labour migrants is comparatively lower than that of male labour migrants. While the male migrants in the middle level remit more than Rs. 55,000 per month, females in the same level remit less than half of it. The same scenario can be observed at the skilled and unskilled levels, except at clerical level. However, at the clerical level, females remit more than male migrants of the same level. It is noteworthy that the amount remitted by them is lower than that of unskilled migrants.

It was found that households of the migrants receive income from multiple sources. These include regular as well as irregular income sources (Table 4).

Table 4 Diversified Sources of Household Income

Sources of Income	Income Type	Pattern of Income	Income Category
➢ **Salary and Wages from:** o Public Sector firms o Private Companies o Small/Medium firms o Tea/Rubber factories	Salary and Wages	Monthly/ Daily	Regular Income
➢ **Other Income I:** o Entrepreneurship o Investment Income o Self-Employment o Rent/Lease	Business Income	Monthly/Daily	
➢ **Other Income II:** o Tea/rubber/ o Coconut/Cinnamon/Beetle o Rice etc.	Agricultural Income	Seasonal	Irregular Income
Lump-Sum Income: o Bonus o Allowances o Overtime Payments etc.	Bonus and other	No Regular Pattern	
Gifts, lottery winning received by the household	Other Irregular Income		
Money sent by the labour migrants working abroad	Remittances	Regular/ Irregular	Remittances

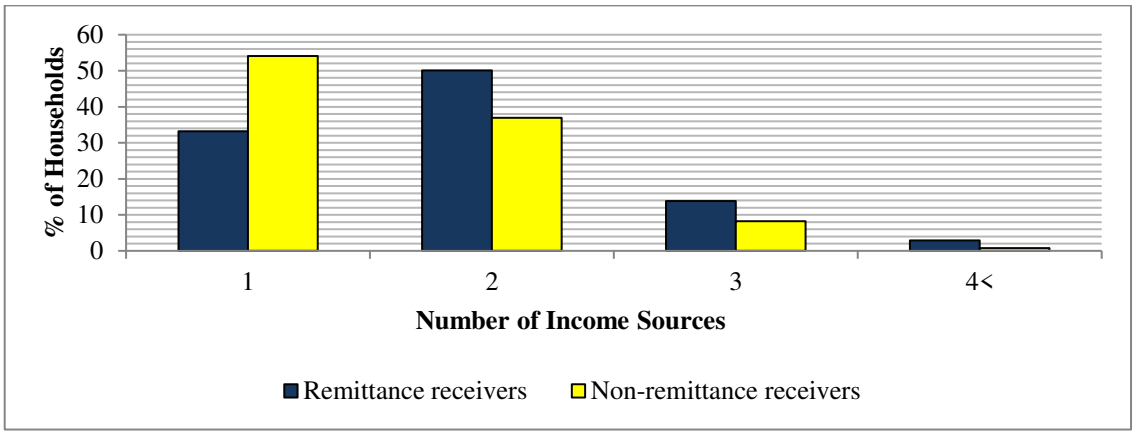
Source: Developed by the author using information collected from focus group discussions

Households receive regular income such as salaries and wages from different types of firms that they are working. Some of the households in the survey area earn income from small and medium scale businesses own by them. Irregular income sources include seasonal or totally irregular type of income received by the households. These include agricultural income and other lump-sum income households receive. People in the survey area are engaged with the cultivation of tea, rubber coconut, cinnamon,

beetle as well as rice. Remittances cannot be categorized as an irregular or regular incomes as part of the households receives them in a regular pattern while the other part in an irregular pattern.

Figure 4 compares the intensity of income diversification between remittance receiving and non-receiving households.

Figure 4 Income Diversification of Households



As shown in the figure, a large percentage of remittance receivers receive income from number of sources compared to their non-remittance receiving counter parts. While more than half of the non-remittance receiving households receive income from only one source, more than two thirds of the remittances receiving households receive income from two or more sources. They receive over Rs.17,000 per capita income per month compared to the income per capita of Rs. 13,000 received by non-remittance receivers (Table 5).

Table 5 Key Indicators of Household Income by Remittance Receiving Status (Mean and Standard Deviations)

Head	Income type and source	Remittance Receiving Status					
		Remittance Receivers		Non- Receivers		All Households	
		Mean	SD	Mean	SD	Mean	SD
Male	Income per capita (Rs.)	18,977	(16573)	14,500	(1883)	27,262	(17604)
	Number of Income Sources [a]	2.043	(0.82)	1.607	(0.96)	1.87	(0.90)
	Remittance (% of income)	56.48	(27.78)	-	-	35.18	(35.00)
Female	Income per capita (Rs.)	16,901	(17112)	11,111	(17624)	16,251	(17243)
	Number of Income Sources [a]	1.67	(0.88)	1.83	(1.12)	1.69	(0.91)
	Remittance (% of income)	73.15	(30.25)	-	-	65.64	(36.23)
All	Income per capita (Rs.)	17,755	(16908)	13,735	(18613)	16758	(17421)
	Number of Income Sources [a]	1.83	(0.87)	1.66	(1.00)	1.78	(0.91)
	Remittance (% of income)	66.29	(30.36)	-	-	50.33	(38.72)

Notes: Mean household size of the remittance receiving households is 3.29 and non-remittance receiving household is 3.37, SD stands for Standard Deviations, [a] Including remittance income

Source: Developed by author based on the survey data

However, share of remittances in the household income is significantly higher among female headed households. While it is more than 56 percent among male headed households, it is more than 73 percent among female headed remittance receiving households. This shows the significance of remittances in the income profile of the female headed remittance receiving households.

It is noteworthy that, remittance receiving households receive income from higher number of sources. On average they receive income at least from two sources. This is higher among male headed households. Having higher number of income support the households to diversify their income and thereby to diversify the risk and strengthens the ability to manage the risk properly.

Earning from higher number of sources on the other hand raises the households in the income ladder. Enhancement of the income of the remittance receivers were examined using the average treatment effects estimated in the propensity score matching analysis. Result of the average treatment effects are as follows.

Table 6 Average Treatment Effect of Remittance Receivers: Stratified Matching Results

	Strata					Total
	1	2	3	4	5	
ATT	289.79	629.05	2258.55	600.14	278.21	4148.78
Increment of income per capita (%)	31.74	18.49	108.02	18,52	8.30	30.83

Source: Calculated by the author based on the survey data

Note: *ATT- Weighted Average Treatment Effect on treated*

According to the results remittances have raised the household income by a substantial percentage. Hence, it is clear that remittance receiving households enjoy income from higher number of income sources compared to other households. Results of the propensity score matching analysis are consistent with the findings of the empirical studies carried out by Adams (1991), Cuong (2008); Kock and Onan (2004) and Castaldo and Reilly (2007) in various country settings, which provide evidence on the remittance impact on household income.

6. Conclusion

Role of remittances in risk and income diversification at the household level in developing country context is explained in the theory of NELM. This hypothesis was examined in this study to find the income diversification of the remittance receiving households in the Sri Lankan context. Descriptive analysis and propensity score matching analysis based on survey data provide enough evidence to support the risk diversification hypothesis. It was found that remittance receivers receive income from higher number of sources compared to other households in the community. They earn regular income such as salaries and wages from public or private sector firms, irregular income from agricultural and non-agricultural activities and remittances from their migrant household members. A large share of remittance receiving households earns income at least from two sources. This is higher among male headed households compared to others. Having income from diversified sources raises them in the income ladder and strengthen them to manage the risk properly. Male headed households, who receive remittances, earn income from more diversified sources compared to female remittance receivers.

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